**State Water Resources Control Board**
Division of Drinking Water

March 11, 2016

System No. 3910800

Certified Mail Return/Receipt
No. 7012 3460 0003 1113 2325

Fred Cordano, Associate Director
California Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

TRANSMITTAL OF COMPLIANCE ORDER NO. 01-10-16R-001

Dear Mr. Cordano:

The State Water Resources Control Board (Water Board), Division of Drinking Water, has issued the Department of Corrections and Rehabilitation (for the Deuel Vocational Institution public water system) a compliance order, which is attached.

Please contact Bhupinder Sahota, Stockton District Engineer, at (209) 948-3881, or Dave Remick at (209) 948-3878, if you have any questions.

Sincerely,

Richard L. Hinrichs, P.E., Chief
Northern California Section
State Water Resources Control Board
Division of Drinking Water

Attachments:
Attachment A – Citation No. 01-10-15C-002
Attachment B – DVI Corrective Action Plan Letter (dated 11/30/15)

R:\Stockton System Files\SJ County\3910800\Enforcement\Compliance Orders\DVI CO Transmittal Ltr Mar 2016

**CALIFORNIA**
**STATE WATER RESOURCES CONTROL BOARD**
**DIVISION OF DRINKING WATER**

TO: Deuel Vocational Institution
ATTN: Fred Cordano, Associate Director
State of California Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

# COMPLIANCE ORDER NO. 01-10-16R-001 FOR VIOLATION OF HEALTH AND SAFETY CODE SECTION 1166555 (a)(1) AND THE SECONDARY DRINKING WATER STANDARDS FOR TOTAL DISSOLVED SOLIDS, SPECIFIC CONDUCTANCE, CHLORIDE, AND MANGANESE

**Dated March 11, 2016**

The State Water Resources Control Board (hereinafter "Water Board"), acting by and through its Division of Drinking Water (hereinafter "Division") and the Deputy Director for the Division (hereinafter "Deputy Director"), hereby issues this compliance order (hereinafter "Order") pursuant to Section 116655 of the California Health and Safety Code (hereinafter "CHSC") to the California Department of Corrections and Rehabilitation (CDCR), Deuel Vocational Institution (hereinafter "DVI") for violation of CHSC section 116555(a)(1) and Title 22, California Code of Regulations (hereinafter "CCR"), Section 64449.

## APPLICABLE AUTHORITIES

**CHSC, Section 116555(a)(1-3) states in relevant part:**

**"116555.**

(a) Any person who owns a public water system shall ensure that the system does all of the following:
(1) Complies with primary and secondary drinking water standards.
(2) Will not be subject to backflow under normal operating conditions.
(3) Provides a reliable and adequate supply of pure, wholesome, healthful, and potable water."

**CHSC, Section 116655 provides:**

**"116655.**

(a) Whenever the department determines that any person has violated or is violating this chapter, or any permit, regulation, or standard issued or adopted pursuant to this chapter, the director may issue an order doing any of the following:

(1) Directing compliance forthwith.
(2) Directing compliance in accordance with a time schedule set by the department.
(3) Directing that appropriate preventive action be taken in the case of a threatened violation.

(b) An order issued pursuant to this section may include, but shall not be limited to, any or all of the following requirements:

(1) That the existing plant, works, or system be repaired, altered, or added to.
(2) That purification or treatment works be installed.
(3) That the source of the water supply be changed.
(4) That no additional service connection be made to the system.
(5) That the water supply, the plant, or the system be monitored.
(6) That a report on the condition and operation of the plant, works, system, or water supply be submitted to the department.

**Title 22, CCR, Section 64449 (hereinafter "Section 64449"), states in relevant part:**

**"64449.**

(a) The secondary MCLs shown in Tables 64449-A and 64449-B shall not be exceeded in the water supplied to the public by community water systems

**Table 64449-A**
**Secondary Maximum Contaminant Levels**
**"Consumer Acceptance Contaminant Levels"**

| ***Constituents*** | ***Maximum Contaminant Levels/Units*** |
|---|---|
| Aluminum | 0.2 mg/L |
| Color | 15 Units |
| Copper | 1.0 mg/L |
| Foaming Agents (MBAS) | 0.5 mg/L |
| Iron | 0.3 mg/L |
| Manganese | 0.05 mg/L |
| Methyl-*tert*-butyl ether (MTBE) | 0.005 mg/L |
| Odor-Threshold | 3 Units |
| Silver | 0.1 mg/L |
| Thiobencarb | 0.001 mg/L |
| Turbidity | 5 Units |
| Zinc | 5.0 mg/L |

**Table 64449-B**
**Secondary Maximum Contaminant Levels**
**"Consumer Acceptance Contaminant Level Ranges"**

| | ***Maximum Contaminant Levels Ranges*** | | |
|---|---|---|---|
| ***Constituent, Units*** | ***Recommended*** | ***Upper*** | ***Short Term*** |
| Total Dissolved Solids, mg/L | 500 | 1,000 | 1,500 |
| Specific Conductance, uS/cm | 900 | 1,600 | 2,200 |
| Chloride, mg/L | 250 | 500 | 600 |
| Sulfate, mg/L | 250 | 500 | 600 |

(b) Each community water system shall monitor its groundwater sources or distribution system entry points representative of the effluent of source treatment every three years and its approved surface water sources or distribution system entry points representative of the effluent of source treatment annually for the following:

(1) Secondary MCLs listed in Tables 64449-A and 64449-B; and

(2) Bicarbonate, carbonate, and hydroxide alkalinity, calcium, magnesium, sodium, pH, and total hardness.

(c) If the level of any constituent in Table 64449-A exceeds an MCL, the community water system shall proceed as follows:

(1) If monitoring quarterly, determine compliance by a running annual average of four quarterly samples;

(2) If monitoring less than quarterly, initiate quarterly monitoring and determine compliance on the basis of an average of the initial sample and the next three consecutive quarterly samples collected;

(3) If a violation has occurred (average of four consecutive quarterly samples exceeds an MCL), inform the Department when reporting pursuant to Section 64469;

(4) After one year of quarterly monitoring during which all the results are below the MCL and the results do not indicate any trend toward exceeding the MCL, the system may request the Department to allow a reduced monitoring frequency.

(d) For the constituents shown on Table 64449-B, no fixed consumer acceptance contaminant level has been established.

(1) Constituent concentrations lower than the Recommended contaminant level are desirable for a higher degree of consumer acceptance.

(2) Constituent concentrations ranging to the Upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters.

(3) Constituent concentrations ranging to the short term contaminant level are acceptable only for existing community water systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources.

## STATEMENT OF FACTS

According to information provided to the Division, DVI operates and maintains the DVI public water system that provides domestic water to approximately 2,500 inmates, a staff of about 1,000 (per the 2014 Annual Report to the Drinking Water Program), and the dairy facilities, which are operated by CDCR at DVI. The water system is operated under authority of a water supply permit (No. 01-89-011) granted by the Division (successor to the California Department of Public Health) to DVI on November 1, 1989, and amended February 1, 2010, (No. 03-10-10PA-005) to add the Reverse Osmosis (hereinafter "RO") Water Treatment Plant and associated Brine Concentrator System (BCS) for the treatment/removal of secondary contaminants. The facilities include a large number of prison cells, residential housing for some staff members, a wastewater treatment plant, a dairy and milk processing plant, and vocational training facilities for the inmates. The water system is a community public water system as defined in CHSC, Section 116275.

The DVI water system uses only groundwater as a source of supply. There are currently three permitted wells that are used in conjunction with the RO treatment facility. However one of the wells (Well No. 5) had been out of service from mid-2013 to mid-January 2016, according to DVI, due to contractual and bidding difficulties for required mechanical repairs. The water for the RO treatment plant during the period of mid-2013 through mid-January 2016 was produced from Wells Nos. 4 and 9, which are located on DVI property. A fourth well (Well No. 6) is maintained as an irrigation well but

is isolated from the potable system. In mid-January 2016, repairs were completed to Well No. 5 and the well has been returned to service.

Title 22, CCR, Division 4, Chapter 15, Article 16 established secondary drinking water standards and also monitoring and reporting requirements for the secondary standards. Community water systems must comply with the secondary MCLs in Tables 64449-A and 64449-B.

The RO treatment plant had been out of service from mid-October 2014 until April 23, 2015. On October 18, 2014, the facility was required to shut down due to overdue maintenance. The BCS had scaled the evaporator tubes to a point that the BCS was unable to keep up with RO concentrate flow. The initial down time was set at about two (2) weeks while the BCS was hydro blasted and cleaned. Once the BCS cleaning process was completed, heating/seeding of the evaporator for restart began October 25, 2014. This process generally takes approximately three days. DVI began to restart the pump on October 27, 2014. It was observed that the evaporator level was above operational parameters. After troubleshooting the issue, plant operators found seal water was leaking though the recirculation pump seal into the evaporator body raising the level and flushing the seed material out of the evaporator seal leg. This condition did not allow the appropriate crystals to accumulate in the evaporator body and the restart was abandoned.

According to information provided to the Division by DVI, DVI procured a rebuilt pump seal and installed it in late December 2014 and attempted to

restart the pump on December 24, 2014, but that effort failed. DVI facility staff applied seal water to the pump and filled the evaporator to test the pump operations. The seal did not hold and began leaking seal water out the backside. The decision was made not to proceed with the restart to minimize any additional damage that might have occurred due to the seal leaking.

DVI procured parts needed to rebuild the pump and the RO plant was restarted on April 23, 2015. Due to the extended shut down periods, DVI was in violation of secondary standards for TDS (Total Dissolved Solids), EC (Specific Conductance), Manganese, and Chloride. RO treatment plant outages have occurred before, sometimes due to planned maintenance and other times due to mechanical problems. According to DVI the outages have all been consistently related to the BCS.

According to information provided to the Division by DVI, since the RO plant was permitted in February 2010, it has not operated during all or part of the following months:

From April 2010 until February 2012: The RO system was out of service initially due to severe corrosion and cracking discovered in components of the BCS. The length of the outage was primarily due to disagreements between the various entities involved in the design and construction of the BCS regarding the causes of the problems and who was responsible.

March 2012: BCS was out of service for a planned inspection.

May through June 2012: BCS was out of service for cleaning. Heat exchanger problem was discovered during restart, which delayed restart until problem was remedied.

November 2012: BCS was out of service for scheduled cleaning for the first half of November.

November through most of December 2013: BCS was out of service for scheduled cleaning. Heat exchanger plates were changed out for thicker titanium plates.

Mid October 2014 through April 23, 2015: BCS out of service as detailed previously in Statement of Facts.

The RO treatment process is intended to reduce total dissolved solids (TDS), chloride, manganese, and iron from the well water and to reduce the specific conductance (EC) levels. During the times that the RO treatment system is out of service, the water receives no treatment other than bag filtration and chlorination prior to delivery to the one million gallon storage tank.

The following table shows the pre-treatment levels of the constituents, other than iron, that the RO treatment removes/reduces in the three system wells. As noted previously, Well No. 5 had been out of service pending mechanical repairs but was returned to service in mid-January 2016.

**Table 1 – Raw Well TDS, Chloride, Manganese, & EC Levels**

| Well Number | TDS (mg/l) (Trigger=1,000 mg/l) | Chloride (mg/l) (Trigger=500 mg/l) | Manganese (ug/l) (MCL=50 ug/l) | Specific Conductance (Trigger=1,600 uS/cm |
|---|---|---|---|---|
| 4 | *1,200 (10/13)<br>**1,600 (10/14) | 380 (10/13)<br>*560 (10/14) | *360 (10/13)<br>*580 (10/14) | *1,600 (10/13)<br>**2,400 (10/14) |
| 9 | **2,900 (10/13)<br>**3,000 (10/14) | **1,300 (10/13)<br>**1,400 (10/14) | *690 (10/13)<br>*410 (10/14) | **4,200 (10/13)<br>**4,700 (10/14) |
| 5 Previously Out of Service | *1,360 (8/12)<br>**1,500 (7/13) | **617 (8/12)<br>**610 (7/13) | *605 (11/12)<br>*520 (7/13) | **2,210 (11/12)<br>**2,400 (7/13) |

***Exceeds MCL or Trigger (Upper Contaminant Level) & **Exceeds Short Term Level**

As can be seen from the table above, the water quality of all three wells is very poor and monitoring confirms that the quality has generally deteriorated over time, with most of the above-listed constituents showing clear increases in concentration.

**Table 2 – Water Distributed without Treatment (TDS, Chloride, Manganese, & EC Levels)**

| | TDS (mg/l) (Trigger=1,000 mg/l) | Chloride (mg/l) (Trigger=500 mg/l) | Manganese (ug/l) (MCL=50 ug/l) | Specific Conductance (Trigger=1,600 uS/cm |
|---|---|---|---|---|
| Combined Treated | **2,600 (10/23/14)<br>**2,500 (10/28/14)<br>**2,600 (12/16/14)<br>**2,600 (12/22/14) | **1,100 (10/23/14)<br>**1,000 (10/28/14)<br>**1,200 (12/16/14)<br>**1,200 (12/22/14) | *760 (10/23/14)<br>*550 (10/28/14)<br>*670 (12/16/14)<br>*730 (12/22/14) | **3,700 (10/23/14)<br>**3,100 (10/28/14)<br>**4,200 (12/16/14)<br>**4,000 (12/22/14) |

***Exceeds MCL or Trigger (Upper Contaminant Level) & **Exceeds Short Term Level**

Table 2 shows the monitoring results for October 2014 and December 2014 of the combined well flow, which is the quality of the combined Wells Nos. 4 and 9 that was pumped into the distribution system without RO treatment. The dates of the monitoring were for certified laboratory analyses but is representative of the water that was distributed for the entire period since the RO had been out of service, which was from mid-October 2014 through April 23, 2015. For clarification, as stated previously, with the RO treatment system out of service, the water received no treatment other than bag

filtration and chlorination prior to delivery to the one million gallon storage tank.

Due to the violations CHSC Section 116555 and Secondary Drinking Water Standards for TDS, EC, Chloride and Manganese, the Division issued Citation No. 01-10-15C-002 (Attachment A) on March 2, 2015, which contained a number of directives. Directive 5 required preparation of a Corrective Action Plan (CAP) identifying improvements to the Reverse Osmosis and Brine Concentrator treatment system designed to correct the water quality problem (violation of the Secondary MCLs and Maximum Contaminant Level Ranges) and ensuring that the DVI Water System delivers water to consumers that reliably and consistently meets all Primary and Secondary Drinking Water Standards. Part 1 of the Corrective Action Plan was required to include a plan and time schedule for making operational improvements to the Reverse Osmosis and Brine Concentrator treatment system. Part 2 of the Corrective Action Plan was required to include a plan and time schedule for completion of each of the phases of the project, including but not limited to, planning, design, construction, and startup, and a date by which the DVI Water System will be in compliance with the Secondary Drinking Water Standards.

CDCR complied with the requirement to prepare and submit the CAP described above. Part 2 of the CAP was due by November 30, 2015. CDCR submitted a Final Report (November 23, 2015) entitled Deuel Vocational Institute Water Treatment Plant Reliability Study, which was prepared by Dewberry Engineers. A letter (Attachment B) dated November 30, 2015 from CDCR was a follow-up to the Dewberry report, which provided clarification of

the proposed project and included timelines for the various phases of the project.

In summary, the two major phases of the project are as follows:

Phase I: Repairs and/or reconstruction of the RO brine ponds, which have been out of service since October 2014 due to leakage of the liners. The brine pond portion of the CAP includes Brine Pond Liner Design followed by Brine Pond Repair Contract, and finally the Brine Pond Construction phase.

Phase II: Vibratory Shear Enhanced Process (VSEP) System development. The Dewberry Engineers study determined that a two-stage VSEP membrane system would provide reliability and redundancy to the RO system. The VSEP system rapidly vibrates the RO membranes to prevent formation of mineral scale on the membrane surface. Saturated minerals crystallize in the bulk solution; however, the rapid vibration maintains saturated minerals in suspension. VSEP also uses anti-scalant and pH adjustment to inhibit precipitation of the saturated minerals in the process. The VSEP process combined with pH suppression to 4.5, anti-scalant addition, and concentrate recycling can reduce the brine volume by 85 to 95 percent.

The VSEP system would replace the current Brine Concentrator and be used as a second stage treatment after the existing RO membrane treatment train to reduce the volume of liquid brine that is discharged to the ponds for evaporation. The VSEP system will consist of a first stage with nine (9) standard VSEP modules operating at 500 psi and the second stage will have

three (3) high pressure modules operating at 1,000 psi. Each stage will operate at 88 percent recovery and yield a combined total VSEP recovery of 92.5 percent as clean permeate. The permeate from the VSEP system will be combined with the existing RO system permeate.

## DETERMINATIONS

Based on the above Statement of Facts, the Division has determined that the DVI Water System has violated CHSC, Section 116555 and Section 64449 in that the water produced by DVI Wells Nos. 4 & 9, or the combined water supplied to the Water System during the fourth quarter of 2014, exceeded the Secondary Drinking Water Standards MCLs and Maximum Contaminant Level Ranges as shown in Table 1 and Table 2 above, and further has determined that said violation had continued from mid-October 2014 through April 23, 2015.

## DIRECTIVES

DVI is hereby directed to take the following actions:

1. On or before September 30, 2016, complete Phase I – Brine Pond Liner Design.

2. On or before September 30, 2017, complete Phase I – Brine Pond Repair Contract Development.

3. On or before June 30, 2018, complete Phase I – Brine Pond Construction

4. On or before May 30, 2017, complete Phase II – VSEP Design.

5. On or before January 31, 2019, complete Phase II – VSEP Contract Development.

6. On or before June 30, 2020, complete Phase II – VSEP Construction.

7. On or before **June 30, 2016**, and every three months thereafter, submit a report to the Division, showing actions taken during the previous calendar quarter (or three months) to comply with the Directives and the status of each of the Directives Nos. 1 through 6.

8. DVI shall maintain the ability to provide an alternate source(s) of drinking water for inmates and staff for all future outages that exceed 7 days.

9. In the event of future RO treatment plant outages, DVI shall notify the Division's Stockton District office within 24 hours by phone or email to inform the District Engineer of the cause of the outage, the expected duration of the outage, and if the outage is likely to exceed 7 days.

10. Notify the Division in writing no later than five (5) days prior to the deadline for performance of any Directive set forth herein if DVI anticipates it will not timely meet such performance deadline.

11. On or before February 19, 2016, submit a written response to the Division indicating its agreement to comply with the directives of this Compliance Order.

All submittals required by this Order shall be addressed to:

Bhupinder S. Sahota, Senior Sanitary Engineer
State Water Resources Control Board
Division of Drinking Water, Stockton District
31 East Channel Street, Room 270
Stockton, California 95202

As used in this Order, the date of issuance shall be the date of this Order; and the date of service shall be the date of service of this Order, personal or by certified mail, on the Water System.

The Division reserves the right to make such modifications to this Order and/or to issue such further order(s) as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be deemed effective upon issuance.

Nothing in this Order relieves Water System of its obligation to meet the requirements of the California SDWA, or any regulation, standard, permit or order issued thereunder.

## PARTIES BOUND

This Order shall apply to and be binding upon Water System, its owners, shareholders, officers, directors, agents, employees, contractors, successors, and assignees.

## SEVERABILITY

The Directives of this Order are severable, and DVI Water System shall comply with each and every provision hereof, notwithstanding the effectiveness of any other provision.

## FURTHER ENFORCEMENT ACTION

The California SDWA authorizes the Board to: issue a citation with assessment of administrative penalties to a public water system for violation or continued violation of the requirements of the California SDWA or any regulation, permit, standard, citation, or order issued or adopted thereunder including, but not limited to, failure to correct a violation identified in a citation or compliance order. The California SDWA also authorizes the Board to take action to suspend or revoke a permit that has been issued to a public water system if the public water system has violated applicable law or regulations or has failed to comply with an order of the Board; and to petition the superior court to take various enforcement measures against a public water system that has failed to

comply with an order of the Board. The Board does not waive any further enforcement action by issuance of this Order.

3/11/2016

Richard L. Hinrichs, P.E., Chief
Northern California Section
State Water Resources Control Board
Division of Drinking Water

Date

Certified Mail No. 7012 3460 0003 1113 2325

cc: J. Price, Warden
State of California Department of Corrections and Rehabilitation
Deuel Vocational Institution
P.O. Box 400
Tracy, CA 95376

R:\Stockton System Files\SJ County\3910800\Enforcement\Compliance Orders\DVI CO 01-10-16R-001 Secondary Standards Mar 2016

Attachment A

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

**State Water Resources Control Board**
Division of Drinking Water

March 2, 2015

System No. 3910800

Certified Mail Return/Receipt
No. 7009 2250 0004 3622 0062

Fred Cordano, Associate Director
California Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

TRANSMITTAL OF CITATION NO. 01-10-15C-002

Dear Mr. Cordano

The State Water Resources Control Board (Water Board), Division of Drinking Water, has issued the Department of Corrections and Rehabilitation (for the Deuel Vocational Institution public water system) a citation, which is attached.

Please contact Bhupinder Sahota, Stockton District Engineer, at (209) 948-3881, or Dave Remick at (209) 948-3878, if you have any questions.

Sincerely,

Richard L. Hinrichs, P.E., Chief
Northern California Section
State Water Resources Control Board
Division of Drinking Water

Attachments: Citation No. 01-10-15C-002
R:DDW\Stockton\Dist10\Stockton System Files\San Joaquin County\3910800\DVI Citation Transmittal Ltr 2-27-2015

CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
DIVISION OF DRINKING WATER

TO: Deuel Vocational Institution
ATTN: Fred Cordano, Associate Director
State of California Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

**CITATION NO. 01-10-15C-002**
**FOR**
**VIOLATION OF HEALTH AND SAFETY CODE SECTION 116555 (a)(1) AND THE SECONDARY DRINKING WATER STANDARDS FOR TOTAL DISSOLVED SOLIDS, SPECIFIC CONDUCTANCE, CHLORIDE, AND MANGANESE**

**Dated March 2, 2015**

The State Water Resources Control Board (hereinafter "Water Board"), acting by and through its Division of Drinking Water (hereinafter "Division") and the Deputy Director for the Division (hereinafter "Deputy Director"), hereby issues this Citation (hereinafter "Citation") pursuant to Section 116650 of the California Health and Safety Code (hereinafter "CHSC") to the California Department of Corrections and Rehabilitation, Deuel Vocational Institution (hereinafter "DVI") for violation of CHSC section 116555(a)(1) and Title 22, California Code of Regulations (hereinafter "CCR"), Section 64449.

## APPLICABLE AUTHORITIES

**CHSC, Section 116555(a)(1-3) states in relevant part:**

"116555.

(a) Any person who owns a public water system shall ensure that the system does all of the following:

(1) Complies with primary and secondary drinking water standards.

(2) Will not be subject to backflow under normal operating conditions.

(3) Provides a reliable and adequate supply of pure, wholesome, healthful, and potable water."

**CHSC, Section 116650 provides:**

"116650.

(a) If the department determines that a public water system is in violation of this chapter or any regulation, permit, standard, citation, or order issued or adopted thereunder, the department may issue a citation to the public water system. The citation shall be served upon the public water system personally or by certified mail. Service shall be deemed effective as of the date of personal service or the date of receipt of the certified mail. If a person to whom a citation is directed refuses to accept delivery of the certified mail, the date of service shall be deemed to be the date of mailing.

(b) Each citation shall be in writing and shall describe the nature of the violation or violations, including a reference to the statutory provision, standard, order, citation, permit, or regulation alleged to have been violated.

(c) A citation may specify a date for elimination or correction of the condition constituting the violation.

(d) A citation may include the assessment of a penalty as specified in subdivision (e).

(e) The department may assess a penalty in an amount not to exceed one thousand dollars ($1,000) per day for each day that a violation occurred, and for each day that a violation continues to occur. A separate penalty may be assessed for each violation."

**Title 22, CCR, Section 64449 (hereinafter "Section 64449"), states in relevant part:**

"64449.

(a) The secondary MCLs shown in Tables 64449-A and 64449-B shall not be exceeded in the water supplied to the public by community water systems.

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**"Consumer Acceptance Contaminant Levels"**

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## Table 64449-B
## Secondary Maximum Contaminant Levels
## "Consumer Acceptance Contaminant Level Ranges"

| | *Maximum Contaminant Levels Ranges* | | |
|---|---|---|---|
| ***Constituent, Units*** | ***Recommended*** | ***Upper*** | ***Short Term*** |
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| Specific Conductance, uS/cm | 900 | 1,600 | 2,200 |
| Chloride, mg/L | 250 | 500 | 600 |
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(2) Bicarbonate, carbonate, and hydroxide alkalinity, calcium, magnesium, sodium, pH, and total hardness.

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(3) If a violation has occurred (average of four consecutive quarterly samples exceeds an MCL), inform the Department when reporting pursuant to Section 64469;

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(d) For the constituents shown on Table 64449-B, no fixed consumer acceptance contaminant level has been established.

(1) Constituent concentrations lower than the Recommended contaminant level are desirable for a higher degree of consumer acceptance.

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The DVI water system uses only groundwater as a source of supply. There are currently three permitted wells that are used in conjunction with the RO treatment facility. However one of the wells (Well No. 5) has been out of service since mid-2013 because, according to DVI it is awaiting mechanical

repairs. The water for the RO treatment plant is currently produced from Wells Nos. 4 and 9, which are located on DVI property. A fourth well (Well No. 6) is maintained as an irrigation well but is isolated from the potable system.

Title 22, CCR, Division 4, Chapter 15, Article 16 established secondary drinking water standards and also monitoring and reporting requirements for the secondary standards. Community water systems must comply with the secondary MCLs in Tables 64449-A and 64449-B.

According to a letter from DVI to the Division dated January 13, 2015, the RO treatment plant has been out of service since mid-October 2014, and remains out of service as of the date of this Citation. On October 18, 2014, the facility was required to shut down due to overdue maintenance. The BCS had scaled the evaporator tubes to a point that the BCS was unable to keep up with RO concentrate flow. The initial down time was set at about two (2) weeks while the BCS was hydro blasted and cleaned. Once the BCS cleaning process was completed, heating/seeding of the evaporator for restart began October 25, 2014. This process generally takes approximately three days. DVI began to restart the pump on October 27, 2014. It was observed that the evaporator level was above operational parameters. After troubleshooting the issue, plant operators found seal water was leaking though the recirculation pump seal into the evaporator body raising the level and flushing the seed material out of the evaporator seal leg. This condition did not allow the appropriate crystals to accumulate in the evaporator body and the restart was abandoned.

According to information provided to the Division by DVI, DVI procured a rebuilt pump seal and installed it in late December 2014 and attempted to restart the pump on December 24, 2014, but that effort failed. DVI facility staff applied seal water to the pump and filled the evaporator to test the pump operations. The seal did not hold and began leaking seal water out the backside. The decision was made not to proceed with the restart to minimize any additional damage that might have occurred due to the seal leaking.

DVI's current action plan is to procure parts needed to rebuild the pump. The time frame is estimated to be early March 2015 for receipt and installation of the parts. RO treatment plant outages have occurred before, sometimes due to planned maintenance and other times due to mechanical problems. According to DVI the outages have all been consistently related to the BCS.

According to information provided to the Division by DVI, since the RO plant was permitted in February 2010, it has not operated during all or part of the following months:

From April 2010 until February 2012: The RO system was out of service initially due to severe corrosion and cracking discovered in components of the BCS. The length of the outage was primarily due to disagreements between the various entities involved in the design and construction of the BCS regarding the causes of the problems and who was responsible.

March 2012: BCS was out of service for a planned inspection.

May through June 2012: BCS was out of service for cleaning. A heat exchanger problem was discovered during restart, which delayed restart until problem was remedied.

November 2012: BCS was out of service for scheduled cleaning for the first half of November.

November through most of December 2013: BCS was out of service for scheduled cleaning. Heat exchanger plates were changed out for thicker titanium plates.

Mid-October 2014 through date of this Citation: BCS out of service as detailed previously in Statement of Facts.

The RO treatment process is intended to reduce total dissolved solids (TDS), chloride, manganese, and iron from the well water and to reduce the specific conductance (EC) levels. During the times that the RO treatment system is out of service, the water receives no treatment other than bag filtration and chlorination prior to delivery to the one million gallon storage tank.

The following table shows the pre-treatment levels of the constituents, other than iron, that the RO treatment removes/reduces in the three system wells. Well No. 5 has been out of service pending mechanical repairs but is considered an active well and will be returned to service once repairs are completed.

**Table 1 – Raw Well TDS, Chloride, Manganese, & EC Levels**

| Well Number | TDS (mg/l) (Trigger=1,000 mg/l) | Chloride (mg/l) (Trigger=500 mg/l) | Manganese (ug/l) (MCL=50 ug/l) | Specific Conductance (Trigger=1,600 uS/cm |
|---|---|---|---|---|
| 4 | *1,200 (10/13)<br>**1,600 (10/14) | 380 (10/13)<br>*560 (10/14) | *360 (10/13)<br>*580 (10/14) | *1,600 (10/13)<br>**2,400 (10/14) |
| 9 | **2,900 (10/13)<br>**3,000 (10/14) | **1,300 (10/13)<br>**1,400 (10/14) | *690 (10/13)<br>*410 (10/14) | **4,200 (10/13)<br>**4,700 (10/14) |
| 5 Out of Service | *1,360 (8/12)<br>**1,500 (7/13) | **617 (8/12)<br>**610 (7/13) | *605 (11/12)<br>*520 (7/13) | **2,210 (11/12)<br>**2,400 (7/13) |

*Exceeds MCL or Trigger (Upper Contaminant Level) & **Exceeds Short Term Level

As can be seen from the table above, the water quality of all three wells is very poor and monitoring confirms that the quality has generally deteriorated over time, with most of the above-listed constituents showing clear increases in concentration.

**Table 2 – Water Distributed without Treatment TDS, Chloride, Manganese, & EC Levels**

| | TDS (mg/l) (Trigger=1,000 mg/l) | Chloride (mg/l) (Trigger=500 mg/l) | Manganese (ug/l) (MCL=50 ug/l) | Specific Conductance (Trigger=1,600 uS/cm |
|---|---|---|---|---|
| Combined Treated | **2,600 (10/23/14)<br>**2,500 (10/28/14)<br>**2,600 (12/16/14)<br>**2,600 (12/22/14) | **1,100 (10/23/14)<br>**1,000 (10/28/14)<br>**1,200 (12/16/14)<br>**1,200 (12/22/14) | *760 (10/23/14)<br>*550 (10/28/14)<br>*670 (12/16/14)<br>*730 (12/22/14) | **3,700 (10/23/14)<br>**3,100 (10/28/14)<br>**4,200 (12/16/14)<br>**4,000 (12/22/14) |

*Exceeds MCL or Trigger (Upper Contaminant Level) & **Exceeds Short Term Level

Table 2 shows the monitoring results for October 2014 and December 2014 of the combined well flow, which is the quality of the combined Wells Nos. 4 and 9 that was pumped into the distribution system without RO treatment. The dates of the monitoring were for certified laboratory analyses but is representative of the water that was distributed for the entire period since the RO has been out of service, which is from mid-October 2014 through the date of this citation. For clarification, as stated previously, with the RO treatment system out of service, the water received no treatment other than bag filtration and chlorination prior to delivery to the one million gallon storage tank.

## DETERMINATIONS

Based on the above Statement of Facts, the Division has determined that the DVI Water System has violated CHSC, Section 116555 and Section 64449 in that the water produced by DVI Wells Nos. 4 & 9, or the combined water supplied to the consumers at DVI during the fourth quarter of 2014, exceeded the Secondary Drinking Water Standards and Maximum Contaminant Level Ranges as shown in Table 1 and Table 2 above, and further has determined that said violation has continued from October 18, 2014 through the date of this citation.

## PENALTIES PURSUANT TO HEALTH AND SAFETY CODE SECTION 116650

The Division hereby assesses upon DVI Water System a penalty of one thousand dollars ($1,000.00) per day for each day that the DVI Water System has violated and/or continues to violate CHSC, Section 116555 and Section 64449 ("the Penalty"). As of the date of issuance of this Citation, the Deuel Vocational Institution Water System has violated CHSC, Section 116555 and Section 64449 for 135 days and thus the amount of penalty imposed as of the date of this Citation is one hundred twenty five thousand dollars ($135,000.00).

## DIRECTIVES

DVI is hereby directed to take the following actions:

1. On or before March 16, 2015, submit a written response to the Division indicating its agreement to comply with the directives of this Citation and with the Corrective Action Plan addressed herein.

2. On or before March 16, 2015, submit to the Division's Stockton District Engineer for approval a plan for providing an alternate source(s) of drinking water for inmates and staff, including, but not limited to, methods for ensuring the security of the drinking water (i.e., lockable hatches if portable tanks are used), and the methods of making the drinking water available to inmates and staff.

3. At all times, beginning on or before March 30, 2015, unless all water that is being delivered from the treatment system meets all primary and secondary drinking water standards, provide an alternate source(s) of drinking water for inmates and staff.

4. Beginning on or before March 30, 2015, DVI shall maintain the ability to provide an alternate source(s) of drinking water for inmates and staff for all future outages that exceed 7 days in accordance with the plan required by Directive No. 2.

5. Prepare for Division review and approval a Corrective Action Plan identifying improvements to the Reverse Osmosis and Brine Concentrator treatment system designed to correct the water quality problem (violation

of the Secondary MCLs and Maximum Contaminant Level Ranges) and ensures that the DVI Water System delivers water to consumers that reliably and consistently meets all Primary and Secondary Drinking Water Standards. Part 1 of the Corrective Action Plan shall include a plan and time schedule for making operational improvements to the Reverse Osmosis and Brine Concentrator treatment system. Part 2 of the Corrective Action Plan shall include a plan and time schedule for completion of each of the phases of the project, including but not limited to, planning, design, construction, and startup, and a date by which the DVI Water System will be in compliance with the Secondary Drinking Water Standards.

6. On or before June 1, 2015, submit Part 1 of the Corrective Action Plan required under Directive No. 5 above to the Division.

7. On or before September 30, 2015, submit Part 2 of the Corrective Action Plan required under Directive No. 5 above to the Division.

8. On or before June 30, 2015, and every three months thereafter, submit a report to the Division, showing actions taken during the previous calendar three months to comply with the Corrective Action Plan.

9. Notify the Division in writing no later than five (5) days prior to the deadline for performance of any Directive set forth herein if DVI anticipates it will not timely meet such performance deadline.

10. Unless suspended, pay the Penalty of $135,000.00 within 30 days of the date of service of this Citation, and each and every 30 days thereafter pay an additional penalty of one thousand dollars ($1,000.00) per day for each day that the violation(s) continue(s) (herein "Additional Penalty", collectively "Additional Penalties"). Payment(s) shall be made by check(s) made payable to the California Division of Drinking Water - Safe Drinking Water Account. The Citation number shall be written on the check(s). Submit the check(s) to: SWRCB Accounting Office, Attn: Drinking Water Program, P.O. Box 1888, Sacramento, CA 95812-1888.

11. The requirement to pay the Penalty and any and all Additional Penalties shall be suspended until March 30, 2015. Such suspension of the requirement to pay the Penalty and any and all Additional Penalties may be extended by the Division beyond March 30, 2015. Such extension may be effected only by written notice from the Division to DVI. Additionally, the requirement to pay the Penalty and any and all additional penalties may be waived if the Division in its sole discretion determines that DVI has complied with the directives of this Citation as the same may

be amended from time to time. Such waiver may be effected only by written notice from the Division to DVI.

All submittals required by this Citation shall be addressed to:

Bhupinder S. Sahota, Senior Sanitary Engineer
State Water Resources Control Board
Division of Drinking Water, Stockton District
31 East Channel Street, Room 270
Stockton, California 95202

As used in this Citation, the date of issuance shall be the date of this Citation; and the date of service shall be the date of service of this Citation, personal or by certified mail, on DVI.

The Division reserves the right to make such modifications to this Citation and/or to issue such further citation(s) as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Citation and shall be deemed effective upon issuance.

Nothing in this Citation relieves DVI of its obligation to meet the requirements of the California SDWA, or any regulation, standard, permit or order issued thereunder.

**PARTIES BOUND**

This Citation shall apply to and be binding upon DVI, its owners, shareholders, officers, directors, agents, employees, contractors, successors, and assignees.

## SEVERABILITY

The Directives of this Citation are severable, and DVI shall comply with each and every provision hereof, notwithstanding the effectiveness of any other provision.

## FURTHER ENFORCEMENT ACTION

The California SDWA authorizes the Division to: issue a citation with assessment of administrative penalties of up to $1,000.00 per day per violation to a public water system for violation or continued violation of the requirements of the California SDWA or any regulation, permit, standard, citation, or order issued or adopted thereunder including, but not limited to, failure to correct a violation identified in a citation or compliance order. The California SDWA also authorizes the Division to take action to suspend or revoke a permit that has been issued to a public water system if the public water system has violated applicable law or regulations or has failed to comply with an order of the Division; and to petition the superior court to take various enforcement measures against a public water system that has failed to comply with an order of the Division. The Division does not waive any further enforcement action by issuance of this Citation.

Richard L. Hinrichs, P.E., Chief
Northern California Section
State Water Resources Control Board
Division of Drinking Water

3/2/2015
Date

Certified Mail No. 7009 2250 0004 3622 0062

cc: J. Price, Warden, Deuel Vocational Institution

Attachment B

STATE OF CALIFORNIA — DEPARTMENT OF CORRECTIONS AND REHABILITATION
EDMUND G. BROWN JR., GOVERNOR

FACILITY PLANNING, CONSTRUCTION AND MANAGEMENT
P.O. Box 942883
Sacramento, CA 94283-0001

November 30, 2015

Mr. Bhupinder Sahota, Senior District Engineer
State Water Resources Control Board
Division of Drinking Water, Stockton District
31 East Channel Street, Room 270
Stockton, CA 95202

DEUEL VOCATIONAL INSTITUTION WATER PLANT RELIABILITY CORRECTIVE ACTION PLAN PART 2

Dear Mr. Sahota:

As required by Citation #01-10-15C-002, Mandate #7, the California Department of Corrections and Rehabilitation (CDCR), Facility Planning, Construction and Management (FPCM) is submitting the Deuel Vocational Institution's (DVI) Long Term Compliance Plan which addresses the disposal of brine water, the modifications of the Reverse Osmosis (RO) Plant, the repairs of the Impoundment Ponds, and the Corrective Action Plan.

FPCM hired Dewberry Consultants to perform a reliability study of the Reverse Osmosis (RO) Plant at DVI in order to identify deficiencies, develop an alternate treatment method to the Brine Concentrator System (BCS), and provide a redundant system to the operation of the plant.

**VIBRATORY SHEAR ENHANCED PROCESS SYSTEM:**

Dewberry performed extensive research of various systems available in today's market and provided various alternatives to FPCM. Upon close examination and evaluation of the alternatives, FPCM determined that the Vibratory Shear Enhanced Process (VSEP®), a proprietary membrane process manufactured by New Logic Research located in Emeryville, California, will provide a fully redundant system for the operation of the plant. The VSEP system is composed of several modules which allows for modules to be taken off-line for maintenance or repair and water still be processed through the remaining on-line modules. The VSEP system rapidly vibrates the RO membranes to prevent formation of mineral scale on the membrane surface. Saturated minerals crystallize in the bulk solution; however, the rapid vibration maintains saturated minerals in suspension. VSEP also uses anti-scalant and pH adjustment to inhibit precipitation of the saturated minerals in the process. The VSEP process combined with pH suppression to 4.5, anti-scalant addition, and concentrate recycling can reduce the brine volume from a brackish water RO plant by 85 to 95 percent. VSEP technology has been used successfully in treating extremely challenging wastewater for more than 200 commercial and industrial facilities. The VSEP system contains a vertical plate and frame with hundreds of stacked disk-shaped membrane leafs, resulting in a very small horizontal footprint.

The system to be implemented at DVI is the ***Two-Stage VSEP Configuration.*** Stage one will have nine (9) standard VSEP modules operating at 500 psi and stage two will have three (3) high pressure modules operating at 1,000 psi. Each stage will operate at 88 percent recovery and

yield a combined total VSEP recovery of 92.5 percent as clean permeate. The clean permeate will be combined with the potable water for use. Stage one will increase the brine total dissolved solids (TDS) concentration to 48,000 mg/L and stage two will increase the brine TDS concentration to 90,000 mg/L. The VSEP system would replace the BCS process at the water plant.

**POND REPAIRS AND/OR CONSTRUCTION DESIGN:**

FPCM is in the process of hiring a consultant to design the pond repair and/or construction. During this design phase the consultant will also be tasked with performing calculations to determine whether installing turbo misters at the ponds will effectively reduce the brine concentrate or whether additional pond storage will be required as the result of the installation of the VSEP system. In addition, the ponds will be designed as four separate ponds with four separate liners. If it is determined that an additional pond(s) is (are) required, the pond(s) will also be constructed with a separate liner. The consultant will be responsible for developing a set of specifications, working drawings and construction costs needed for the repair and/or construction of the pond liners. The consultant will also seek approval from the California State Fire Marshal which is required in order to perform the pond repair and/or construction. The estimated cost for this work is $226,000.

**VSEP DESIGN:**

In the next step of this project, FPCM will hire a consultant to design the VSEP system which is required by the State of California. FPCM will retain a consultant for the design of the VSEP system by September 1, 2016. This date is based on the fact that the funding required for this phase will not be available until next Fiscal Year (FY) 2016/17. The selected consultant will further research this option and make any necessary adjustments to meet the stringent regulations required by the State Water Resources Control Board. The consultant will be responsible for developing a set of specifications and working drawings required for the construction of the VSEP. The consultant will also seek approval from the California State Fire Marshal which is required for the construction of the VSEP system. The estimated cost for the design of the VSEP system is $600,000.

**POND CONSTRUCTION:**

Construction funding for the pond repair and/or construction will likely come from CDCR's Special Repair Projects fund. The estimated construction cost for the pond repair and/or construction is estimated between $1,500,000 and $3,000,000. It is FPCM's intent to fund the construction phase for FY 16/17.

**VSEP CONSTRUCTION:**

The funding for the consultants will be provided by CDCR's Special Repair Projects funds; however, the funding for the construction for the VSEP system will be requested through the General Fund capital outlay process. The estimated cost for construction of the VSEP system is $10,000,000 to $15,000,000. The capital outlay process is lengthy and scrutinized at numerous levels within CDCR and the Department of Finance (DOF). CDCR will request funding for the construction of the VSEP system during the next capital outlay budget cycle; however, it will required a few months to

evaluate and complete the request through the internal approval process. The approval process at the DOF is longer and will require approval from the Governor's Office and Legislature. CDCR cannot guarantee that the project will be included in the State Budget for funding.

In summary, FPCM plans to perform the following tasks:

- Within the next 30 days, hire a consultant to design the pond repair and/or construction.
- Evaluate the installation of Turbo Mister Evaporators or the need for additional pond(s).
- Task the consultant with the development of specifications and working drawings for the repair and/or construction of the ponds.
- Retain a consultant for the development of specifications and working drawings for the installation of the new VSEP system as an alternate technology to replace the BCS by September 1, 2016.
- Develop contracts for the implementation of the repair and/or construction of the ponds for FY 16/17.
- Continue the disposal of the brine concentrate at the East Bay Municipal Utility District until repair of the ponds are completed.
- Create a redundant VSEP system so that the plant is always operational during routine maintenance and/or failure. The VSEP system is composed of several modules which allows for modules to be taken off-line for maintenance or repair and water still be processed through the remaining on-line modules.
- Submit request for construction funding of the VSEP system through the Capital Outlay Process for the next budget cycle, FY18/19.
- Develop contracts for the construction/installation of the VSEP system – If approved in budget cycle 18/19 the anticipated completion date would be in May 2020.

Should you require additional information, please contact Pedro Reyes, Regional Manager at (916) 255-0516, or myself at (916) 255-2583.

Sincerely,

FRED CORDANO
Associate Director
Facilities Asset Management Branch
Facility Planning, Construction and Management Division

cc: David Remick, Sanitation Engineer, SWRCB, Division of Drinking Water
Jerome Price, Warden (DVI)
Nathan Gaughan, Associate Warden Business Services (DVI)
Tony Schumacher, Correctional Plant Manager II (DVI)
Pedro Reyes, Regional Manager (FPCM)

Enclosures